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10/579,261

05/11/2006

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210 7590 07/06/2009  
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EXAMINER

CHANG, CELIA C

ART UNIT

PAPER NUMBER

1625

MAIL DATE

DELIVERY MODE

07/06/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/579,261 | <b>Applicant(s)</b><br>LINDSLEY ET AL. |  |
|                              | <b>Examiner</b><br>Celia Chang       | <b>Art Unit</b><br>1625                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 27-30 is/are pending in the application.
- 4a) Of the above claim(s) 28-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>3/11/09</u> .   | 6) <input type="checkbox"/> Other: _____                          |

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**DETAILED ACTION**

1. Applicant's election with traverse of Group I, claim 17 and claims 1-16, 27 reading on R2 is phenyl, cyclohexyl or pyridyl compounds in the reply filed on Mar. 11, 2009 is acknowledged. The traversal was on the ground that since there is formula I, the requirement as defined in Rule 13.2 is met. Please note that it was delineated in the restriction requirement that in **Annex B Part 1(f)v**, indicates that "When dealing with alternatives, if it can be shown that at least *one* Markush alternative is not novel over the prior art, the question of unity of invention shall be reconsidered by the examiner". In the instant case, at least one Markush alternative is not novel because prior art by Lindsley CA 146:492593 anticipates group I, thus the lacking of unity of invention has been found. Therefore, evidence by the art that the R2 moiety of formula I must be considered, i.e. restriction based on R2.

The requirement is deemed proper and is therefore made FINAL.

Claims 1-17, 27 reading on R2 is phenyl, cyclohexyl or pyridyl is prosecuted. Claims 28-30 and the remaining subject matter of claims 1-16, 27 are withdrawn from consideration per 37 CFR 1.142(b).

2. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Please note that several compounds have an "N" atom on the phenyl ring. It is unclear what it is. Is it NO<sub>2</sub>? Is it NR<sup>10</sup>R<sup>11</sup>? etc. Correction is required with antecedent basis from the specification.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 1-6, 12, 14, 27 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Bao et al. US 6,303,637.

See col. 33-34, examples 18-20 .

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-17, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bao et al. US 6,303,637 (cited on 1449).

The anticipatory species has been pointed out supra in section 3 and hereby incorporated by reference. The difference between the anticipatory species and the instant claims is that instead of alkoxy substitution of the R2 phenyl ring, the instant dependent claims have more limited substituents such as halogen, and more specific branched alkyl in R3. Generically, the substituents is optionally halogen, fluoroalkyl etc. (see col. 6, R6/R7) and the R5 moiety can be SO<sub>2</sub>-alkyl which included branched alkyl (see col. 7, line 65). Therefore, the instant claims are the result of picking and choosing generically equivalent moieties of the prior art guided by the species. In absence of unexpected results, there is nothing unobvious in picking some among many. In re Lemin 141 USPQ 814.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(A) Claims 17, 1-16, 27 reading on R2 is R2 is phenyl, cyclohexyl or pyridyl are rejected under 35 U.S.C. 103(a) as being unpatentable over Lloyd et al. US 7,005,436.

*Determination of the scope and content of the prior art (MPEP §2141.01)*

Lloyd et al. '436 disclosed potassium channel inhibitory compounds which are structurally similar to the instant claims. A structurally close compound is disclosed on col. 537-538 compound 936.

*Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)*

The difference between the elected compounds and the specific example 936 is instead of the R2 being phenyl, cyclohexyl or pyridyl, the R2 moiety of the exemplified species is pyrazinyl. Generically, phenyl or pyridyl are optional choices for this moiety as observed in the many examples of the tables. Particularly col. 40 example 4.

*Finding of prima facie obviousness---rational and motivation (MPEP §2142-2143)*

One having ordinary skill in the art in possession of the Lloyd et al. '436 reference is in possession of the whole generic concept. Especially, a large number of variation among the Markush elements have been demonstrated in the examples. The modification of a proven compound guided by the generic teaching and other exemplified lead compounds would be obvious since the Markush elements have been well enabled and guided. In absent of unexpected results, there is nothing unobvious in choosing some among many. In re Lemin 141 USPQ 814.

(B) Claims 17, 1-16, 27 reading on R2 is R2 is phenyl, cyclohexyl or pyridyl are rejected under 35 U.S.C. 103(a) as being unpatentable over Lloyd et al. US 7,005,436 in view of Wermuth or Williams and Patani.

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Determination of the scope and content of the prior art (MPEP §2141.01)

Lloyd et al. '436 disclosed potassium channel inhibitory compounds which are structurally similar to the instant claims. A structurally close compound is disclosed on col. 39, line 35, compound 2.

Ascertainment of the difference between the prior art and the claims (MPEP §2141.02)

The difference between the prior art species and the instant claims is that instead of 4-phenyl (the phenyl wherein R1 is attached), the prior art species has a thienyl moiety. Wermuth p.206, Williams p.61, table 2.9, Patani p.3158 section E, taught that thienyl and phenyl moieties are classical bioisostere replacement of each other due to similarity in size, charge and conformation. Patani taught also the same replacement and showed that the state of the art is "Bioisosterism represents one approach used by the medicinal chemists for the rational modification of lead compounds....".

Finding of prima facie obviousness—rational and motivation (MPEP §2142-2143)

One having ordinary skill in the art would be motivated by the bioisosteric rational design choice of the lead compound 2 with the phenyl moiety knowing that such modification would offer compounds which are similar in conformation with the expectation of similar biological activity. Especially, one having ordinary skill guided by the compound 2 example would pick and choose from the generic equivalency of the R2 moieties (see col. 6 lines 30-35) the phenyl moiety among the generic groups.

6. Claims 1-17, 27 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-14, 22-23 of copending Application No. 10/593,950 in view of Wermuth or Williams and Patani.

The instant claims are bioisosteric compounds of the copending claims. The same rational of finding bio-isosteres prima facie obvious as delineated supra, drawn to pyridyl and phenyl rings, is also applicable here and hereby incorporated by reference.

This is a provisional obviousness-type double patenting rejection.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Celia Chang, Ph. D. whose telephone number is 571-272-0679. The examiner can normally be reached on Monday through Thursday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet L. Andres, Ph. D., can be reached on 571-272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*OACS/Chang*  
*Jun. 29, 2009*

*/Celia Chang/  
Primary Examiner  
Art Unit 1625*